

MARINE RESOURCES AND ENGINEERING DEVELOP-  
MENT ACT OF 1965

JULY 29, 1965.—Ordered to be printed

Mr. MAGNUSON, from the Committee on Commerce, submitted the following

## REPORT

[To accompany S. 944]

The Committee on Commerce, to which was referred the bill (S. 944) to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes, having considered the same, reports favorably thereon with amendments and recommends that the bill as amended do pass.

## COMMITTEE AMENDMENT

The committee amendment, in the nature of a substitute, is as follows:

## SHORT TITLE

SECTION 1. This Act may be cited as the Marine Resources and Engineering Development Act of 1965.

## DECLARATION OF POLICY AND PURPOSE

SEC. 2. The marine science activities of the United States should be conducted so as to contribute to the following objectives:

- (1) The accelerated development of the physical, chemical, geological, and biological resources of the marine environment.
- (2) The expansion of human knowledge of the marine environment.
- (3) The encouragement of private investment enterprise in exploration, technological development, marine commerce, and economic utilization of the resources of the marine environment.
- (4) The preservation of the role of the United States as a leader in marine science and resource development.
- (5) The advancement of education and training in marine science.
- (6) The development and improvement of the capabilities, performance, use, and efficiency of vehicles, equipment, and instruments for use in exploration, research, surveys, the recovery of resources, and the transmission of energy in the marine environment.

(7) The effective utilization of the scientific and engineering resources of the Nation, with close cooperation among all interested agencies, public and private, in order to avoid unnecessary duplication of effort, facilities, and equipment, or waste.

(8) The cooperation by the United States with other nations and groups of nations and international organizations in marine science activities when such cooperation is in the national interest.

#### THE NATIONAL COUNCIL ON MARINE RESOURCES AND ENGINEERING DEVELOPMENT

Sec. 3. (a) There is hereby established, in the Executive Office of the President, the National Council on Marine Resources and Engineering Development (hereinafter called the "Council") which shall be composed of—

(1) The Vice President, who shall be Chairman of the Council.

(2) The Secretary of State.

(3) The Secretary of the Navy.

(4) The Secretary of the Interior.

(5) The Secretary of Commerce.

(6) The Chairman of the Atomic Energy Commission.

(7) The Director of the National Science Foundation.

(8) The Secretary of Health, Education, and Welfare.

(b) The President may name to the Council such other officers and officials as he deems advisable.

(c) The President shall from time to time designate one of the members of the Council to preside over meetings of the Council during the absence, disability, or unavailability of the Chairman.

(d) Each member of the Council, except those designated pursuant to subsection (b), may designate another officer of his department or agency to serve on the Council as his alternate in his unavoidable absence.

(e) Each alternate member designated under subsection (d) of this section shall be designated to serve as such by and with the advice and consent of the Senate unless at the time of his designation he holds an office in the Federal Government to which he was appointed with the advice and consent of the Senate.

(f) The Council shall advise and assist the President, as he may request, with respect to the performance of Federal functions in the field of marine science and engineering, including but not limited to the following functions:

(1) survey all significant marine science activities, including the policies, plans, programs, and accomplishments of all departments and agencies of the United States engaged in such activities;

(2) develop a comprehensive program of marine science activities, including, but not limited to, exploration, exploitation, and conservation of the resources of the marine environment, marine engineering, studies of air-sea interaction, transmission of energy, and communications, to be conducted by departments and agencies of the United States;

(3) designate and fix responsibility for the conduct of marine science activities by Departments and agencies of the United States, including, but not limited to, exploration, exploitation, and conservation of the resources of the marine environment, marine engineering, studies of air-sea interaction, transmission of energy, and communications;

(4) provide for effective cooperation among all departments and agencies of the United States engaged in marine science activities, and specify, in any case in which primary responsibility for any category of the marine science activities has been assigned to any department or agency, which of those activities may be carried on concurrently by other departments or agencies;

(5) resolve differences arising among departments and agencies of the United States with respect to marine science activities under this Act, including differences as to whether a particular project is a marine science activity;

(6) review annually all marine science activities conducted by departments and agencies of the United States in light of the policies, plans, programs, and priorities developed pursuant to this Act;

(7) undertake a comprehensive study of the legal problems arising out of the management, use, development, recovery, and control of the resources of the marine environment; and

(8) establish long-range studies of the potential benefits to the United States economy, security, health, and welfare to be gained from marine resources, engineering, and science.

(g) The Council may employ a staff to be headed by a civilian executive secretary who shall be appointed by the President, by and with the advice and consent of the Senate, and shall receive compensation at a rate established by the President at not to exceed that of level II of the Federal Executive Salary Schedule. The executive secretary, subject to the direction of the Council, is authorized to appoint and fix the compensation of such personnel, including not more than seven persons who may be appointed without regard to civil service laws or the Classification Act of 1949 and compensated at not to exceed the highest rate of grade 18 of the General Schedule of the Classification Act of 1949, as amended, as may be necessary to perform such duties as may be prescribed by the President.

#### COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES

SEC. 4. (a) To assist the President and the Council in carrying out the functions stated in sections 3(f) (1), (2), (7), and (8) of this Act, there is authorized to be established, at the discretion of the President, a Commission on Marine Science, Engineering and Resources composed of fifteen members appointed by the President from among persons with a competency in the areas designated in this Act. The Commission may include five representatives from Government, five representatives from industry, and five representatives from universities, institutions, or laboratories engaged in marine science pursuits and upon establishment of such Commission, the President shall designate from among its members a Chairman and a Vice Chairman.

(b) Members of the Commission appointed from outside the Government shall each receive \$100 per diem when engaged in the actual performance of duties of the Commission. Members of the Commission appointed from within the Government shall serve without compensation in addition to that received for their services to the Government.

(c) The Commission, its Chairman and Vice Chairman, shall at all times cooperate effectively with the Council in carrying out the responsibilities and functions delegated to it under this Act by the President through the Council, and shall report at such intervals as may be determined by the Council, its findings and recommendations for the consideration of the Council.

(d) In addition to the duties set forth in subsection (a) of this section and such other duties as may be assigned to it, the Commission shall survey the marine science activities of the United States, make recommendations for the most effective organizational structure for conduct of Federal activities in this area, and make recommendations for the encouragement of private investment in marine science and resource development.

(e) Subject to determinations of the Council, the Commission shall appoint and fix the compensation of such personnel as it deems advisable, without regard to the civil service laws and the Classification Act of 1949, as amended. In addition, subject to determination of the Council, the Commission may secure temporary and immediate services to the same extent as is authorized the departments and agencies of the Government by section 15 of the Administrative Expenses Act of 1946, but at rates not to exceed \$100 per diem for individuals.

(f) All members and other personnel of the Commission shall be reimbursed for travel, subsistence, and other necessary expenses incurred in carrying out this Act.

(g) The Commission, whatever may be the requirements of the Council under paragraph (c) of this section, shall submit to the Council not later than eighteen months after the establishment of the Commission as provided in subsection (a) of this section, a final report of its findings and recommendations. The Commission shall cease to exist thirty days after it has submitted its final report.

SEC. 5. (a) The Council, under the foreign policy guidance of the President and as he may request, may coordinate a program of international cooperation in work done pursuant to this Act, pursuant to agreements made by the President with the advice and consent of the Senate.

(b) The President shall transmit to the Congress in January of each year a report, which shall include (1) a comprehensive description of the activities and the accomplishments of all agencies and departments of the United States in the field of marine science activities during the preceding year, and (2) an evaluation of such activities and accomplishments in terms of the attainment of, or the failure to attain, the objectives set forth pursuant to this Act.

(c) Reports made under this section shall contain such recommendations for legislation as the Chairman of the Council or the President may consider necessary or desirable for the attainment of the objectives of this Act, and shall contain an

estimate of funding requirements of each agency and department of the United States for marine science activities during the succeeding fiscal year.

(d) No information which has been classified for reasons of national security shall be included in any report made under this section, except pursuant to authorization given by the President.

SEC. 6. (a) The Council shall arrange with the Federal Bureau of Investigation for the conduct of such security or other personnel investigation of the Council's officers, employees, and consultants, as it deems appropriate, and if any such investigation develops any data reflecting that the individual who is the subject thereof is of questionable loyalty there shall be a full field investigation of the matter, the results of which shall be furnished to the Council.

(b) The Atomic Energy Commission may authorize any of its employees, or employees of any contractor, prospective contractor, licensee, or prospective licensee of the Atomic Energy Commission under subsection 145(b) of the Atomic Energy Act of 1954 (42 U.S.C. 2165(b)), to permit any member, officer, or employee of the Council to have access to restricted data relating to oceanography and the marine sciences which is required in the performance of his duties and so certified by the Council but only if (1) the Council or designee thereof has determined, in accordance with the established personnel security procedures and standards of the Council, that permitting such individual to have access to such restricted data will not endanger the common defense and security, and (2) the Council or designee thereof finds that the established personnel and other security procedures and standards of the Council are adequate and in reasonable conformity to the standards established by the Atomic Energy Commission under section 145 of the Atomic Energy Act of 1954 (42 U.S.C. 2165). Any individual granted access to such restricted data pursuant to this subsection may exchange such data with any individual who (A) is an officer or employee of the Department of Defense, or any department or agency thereof, or a member of the Armed Forces, or a contractor or subcontractor of any such department, agency, or armed force, or an officer or employee of any such contractor or subcontractor, and (B) has been authorized to have access to restricted data under the provisions of section 143 of the Atomic Energy Act of 1954 (42 U.S.C. 2163).

SEC. 7. Information obtained or developed under this Act shall be made available for public inspection except (a) information authorized or required by Federal statute to be withheld, and (b) information classified to protect the national security: *Provided*, That nothing in this Act shall authorize the withholding of information from the duly authorized committees of Congress.

SEC. 8. (a) For the purposes of this Act the term "marine science" shall be deemed to apply to oceanographic and scientific endeavors and disciplines, engineering and technology in and with relation to the marine environment; and the term "marine environment" shall be deemed to include (1) the oceans, (2) the Continental Shelf of the United States, (3) the Great Lakes, (4) seabed and subsoil of the submarine areas adjacent to the coasts of the United States to the depth of two hundred meters, or beyond that limit, to where the depths of the superjacent waters admit of the exploitation of the natural resources of such areas, (5) the seabed and subsoil of similar submarine areas adjacent to the coasts of islands which comprise United States territory, and (6) the resources thereof.

(b) There is hereby authorized to be appropriated such sums as may be necessary to carry out this Act, but sums appropriated for any one fiscal year shall not exceed \$1,000,000.

SEC. 9. The provisions of this Act shall expire at the termination of June 30, 1970.

#### Amend the title so as to read:

A bill to provide for expanded research and development in the marine environment of the United States, to establish a National Council on Marine Resources and Engineering Development, and a Commission on Marine Science, Engineering and Resources, and for other purposes.

## PUROSE OF THE BILL

The purpose of S. 944 is to further ocean engineering and exploration, expand marine science and technology, and intensify development and utilization of ocean, Continental Shelf, and Great Lakes resources.

The objectives of S. 944, as amended, would be achieved by—

1. Establishment of a statutory base, premised on a declaration of constructive policy and purpose, for Federal activities in the marine environment.

2. Establishment of a Cabinet-level National Council on Marine Resources and Engineering Development.

3. Establishment, at the discretion of the President, of a Commission on Marine Science, Engineering and Resources, consisting of representatives selected from industry, academic institutions, and government, to assist the President and the Council in carrying out functions stated in the act, and such other duties as may be assigned to it.

Enactment of S. 944 will place oceanography, marine science, engineering and resource development on an administrative parity with the National Space and Aeronautics Council, National Security Council, Federal Radiation Council, and the Water Resources Council, the last established by legislation signed and approved by the President on July 22. Each are statutory creations, as also will be the National Council on Marine Resources and Engineering Development upon enactment of S. 944. Each statute also provides that the Council shall have an independent staff.

S. 944 also authorizes the President, at his discretion, to appoint a Commission on Marine Science, Engineering and Resources which, for a period of 18 months, would be engaged in surveys of significant marine science activities, plans and programs, studies of related legal problems, and studies of potential benefits to be derived from expanded Federal activities in the marine environment.

The Committee on Commerce held 3 days of hearings on S. 944 at which eminent marine scientists and engineers associated with industry, and directors of marine and technological programs at Eastern, Western, Southern, and Midwest universities testified in support of the bill, a number offering recommendations for broadening the proposed legislation.

Other scientists and industry representatives have similarly endorsed S. 944 by correspondence.

Committee amendments to the bill reflect the counsels of these informed and expert witnesses and commentators, and of professional scientists and technologists experienced in current or recent Government operations.

## BACKGROUND

Since 1958 the Committee on Commerce has received numerous and repeated expressions of a need for expanded scientific, engineering and resource development and utilization in the marine environment, and for improved coordination of Federal activities in this field.

The committee responded in July 1959, with a Senate resolution (S. Res. 136) endorsing recommendations contained in a report of the Committee on Oceanography of the National Academy of Sciences—

National Research Council, and commending this report to the attention and consideration of the President, the Bureau of the Budget, and to the heads of departments and agencies included in the report, which envisioned a 10-year oceanographic program.

All members of the Committee on Commerce joined in cosponsoring this resolution; it was unanimously approved by the committee, reported to the Senate, and there unanimously adopted.

Following passage of Senate Resolution 136, bills were introduced in the Senate both in the 86th and 87th Congresses designed to implement the recommendations of the Committee on Oceanography. These bills were considered and reported favorably by the Committee on Commerce, and were passed by the Senate.

Legislation also was introduced in the House of Representatives during the 86th, 87th, and 88th Congresses with, among other objectives, that of providing the national oceanographic effort with a legislative base. None of the bills referred to above have become law.

The national marine science program continues to lack a legislative base, a legislative commitment of policy and purpose, or a statutory body to plan, evaluate, and coordinate such a program. These would be provided by enactment of S. 944.

The work of the Committee on Oceanography of the National Academy of Sciences, and of the Congress, supported by certain agency officials, industry, and a wide segment of news and information media, has not, however, been without results.

Authority for oceanwide research and surveys has been extended by legislative enactment to the U.S. Coast Guard, Coast and Geodetic Survey, and the Geological Survey. Total funding for oceanographic research and development increased from \$26.28 million in fiscal 1960, to \$123.1 million for fiscal 1964, including construction of a number of new research and survey ships and new marine laboratories.

For fiscal 1965 an additional \$12 million was approved, and for fiscal 1966 the Bureau of the Budget requested \$141.6 million for funding marine science, research and development activities of four Government departments and four independent agencies, plus a small sum for the State Department.

Despite this evidence of some progress, the Office of Science and Technology has conceded, in response to a committee inquiry, that with relation to the 10-year program proposed in 1963 by the Federal Council for Science and Technology, the program currently is lagging.

The committee, in response to a question, was informed:

The long-range national oceanographic plan did not project annual budgets, but rather recommended total spending over a 10-year period. Interpolation of the total recommendation places the fiscal 1965 total about \$30 million (or 20 percent) below the projected level and the fiscal year 1966 budget at approximately \$50 million (or 25 percent) below the projected level.

It is appropriate to recall that on March 2, in transmitting the 1966 oceanographic program and budget to the Congress, President Johnson stated:

I believe that the total amount is the absolute minimum if our Nation is to use its capabilities well and to progress toward its objectives in oceanography.

Elsewhere in his letter of transmittal, the President, in part, stated:

It is becoming increasingly clear that there are large mineral deposits under the oceans. But before this treasure becomes useful we must first locate it and develop the technology to recover it economically. We must learn much more about marine biology if we are to tap the great potential food resources of the seas.

Again, in his letter, the President stated:

The challenge now is to expand our utilization of these resources.

S. 944 is not a funding bill. It does not propose greatly augmented expenditures in the absence of specific knowledge of ocean and marine resources and where they are located, or in the development of the technology to recover these resources economically.

S. 944 is designed to stimulate acquisition of needed knowledge and necessary technology, to encourage private investment enterprise in endeavors looking toward economic and greater utilization of the resources of the marine environment, and to meet such challenges as may arise to the recovery of these resources.

S. 944 proposes to expand our utilization of the oceans, the Great Lakes, and the Continental Shelf by conducting appropriate marine surveys, by development of a comprehensive program of marine science activities including exploration, exploitation, and conservation of the resources of the marine environment, by development of ocean engineering, by studies of air-sea interaction and transmission of energy, by directing long-range studies of the potential benefits to the U.S. economy, security, health and welfare to be gained from marine resources, engineering and science, and by providing for a thorough study of the legal problems arising out of the management, use, development, recovery and control of marine resources.

Responsibility for carrying out these activities would be placed with the National Council on Marine Resources and Engineering Development, assisted by the Commission on Marine Science, Engineering and Resources.

Industry, already making tremendous contributions to marine technology and engineering, would be represented on the Commission.

Industry also is taking an active role in the movement to accelerate utilization of marine resources.

In a letter to the President dated March 29, the presidents or board chairmen of 12 of America's largest industries, stated in part:

We believe, with you, that freedom from want is possible, but only if we add to the land's productivity the most fertile and least used of man's resources—those of the seven seas. Potentials for almost limitless food production, for supplementing the land's minerals, for an inexhaustible supply of pure water, for new sources of fuels and energy, for a revitalized, superior merchant marine, and even for harnessing wind and weather, exist in the world's oceans, if we can but learn to apply our American technological genius to their use. This learning and utilization, as industry is coming to realize, provides opportunities for economic growth unparalleled since the industrial revolution.

Elsewhere the letter stated:

We envision industry's contribution as part of a team effort in which, under your leadership, the Federal agencies, the Congress, the universities, the States, and the business-industrial communities develop and implement a coordinated truly national program that builds on the work already accomplished and in progress, but which welds the many diffuse and scattered present interests into a cohesive whole.

The committee also was aware of industry eagerness to participate and cooperate with the Government in the development of marine engineering and in the efficient utilization of marine resources. This knowledge came not only from correspondence received by the committee, but from the testimony of directors of academic institutions and laboratories given at earlier hearings on March 16.

Witnesses of both industry and academic groups emphasized the need for legislation such as that proposed in S. 944 and strongly supported provisions of the bill.

#### THE NEED FOR LEGISLATION

Among the witnesses who testified before the committee was Capt. H. A. Arnold, U.S. Navy, retired, assistant to the chief scientist, United Aircraft Corp., East Hartford, Conn., and for 3 years consultant to the Federal Council for Science and Technology when the Chairman of the Council and Science Adviser to the President was Dr. Jerome B. Wiesner.

Captain Arnold's testimony before the committee included the following:

It has become increasingly evident in the past 2 or 3 years that the establishment of a truly vital national oceanographic program will require additional action. The goals stated in the long-range program were general: Strengthening basic science, improving national defense, managing resources of the world oceans, managing resources in domestic waters, and protecting life and property. Although perhaps tacitly endorsed, these goals still lack specific legislative recognition. \* \* \* I believe that the reduced rate of growth of the Federal oceanographic budget after 1962 is partly a reflection of the difficulty in devising and launching new programs of ocean technology.

Elsewhere in his testimony Captain Arnold stated:

Exploitation of the oceans is inevitable. If the United States does not lead a unified thrust seaward, others will. A recent international agreement, which since June 1964, has the effect of an international treaty, grants each nation the right to explore and exploit its Continental Shelf to a depth of 600 feet, and deeper where the capability exists to do so. That last part is very important to us. It might well be the starting gun of an international race to develop deep ocean technology. Here is our opportunity to regain leadership in the sea through exploitation of our great strength in science and technology.

In his concluding testimony before the committee, Captain Arnold said:

I believe that the statement of national policy and the National Council which would result from enactment of S. 944 would provide the following:

One, legislative recognition, which is very important, and a firm base for more positive executive action.

Two, emphasis, coherence, and long-range stability which would encourage scientific oceanography to grow in proportion to the need.

Three, a comprehensive program of ocean technology and engineering, embracing exploitation and development of the capability to do useful work in the ocean, particularly in the nonmilitary area. This would in turn provide guidance and encouragement to industry and the tangible evidence of Government support would stimulate increased industrial participation.

Four, an essential step toward a strong posture for the conflicts which will result from increased exploitation of the oceans by many nations.

Finally, a basis for long-range usage planning for the Great Lakes and the oceans contiguous to our own shores, to the end that special interests or thoughtless exploitation will not damage the general welfare of U.S. citizens.

Dr. John C. Calhoun, Jr., vice chancellor for programs, Texas A. & M. University, and former Science Adviser to the Secretary of the Interior, told the committee:

The proposed National Council would provide a policy deliberating group to advise the President and the Congress, to give priority to specific national goals, to see that balance is maintained among all participating agencies, to advise on procedures for carrying out new goals, and to give full executive support to budgets for meeting the national purpose.

Dr. Calhoun also suggested that proposals for creation of a Marine Exploration and Development Commission be included in the bill. Subsequently, the bill was amended to provide for the establishment of a Commission on Marine Science, Engineering and Resources to assist the President and the Council.

#### THE UNITED STATES AND THE WORLD OCEAN

Much of the motivation of the Committee on Commerce in its endeavor to stimulate marine resource and engineering development derives from its day-to-day awareness of the unique geographic position of the United States with relation to other nations.

The United States and its sister republics on this continent occupy what is virtually an island, separated from Europe, Africa, Asia, and even South America a by vast expanse of water.

This fact has a tremendous impact on the extent and nature of the Nation's foreign commerce. Approximately 99 percent of the hundreds of millions of tons of cargo moving to and from foreign ports last year were waterborne. Waterborne also are the many critical

and strategic materials for which this Nation is dependent on foreign sources.

Yet less than 9 percent of this vital commerce moves on American-flag vessels.

The coastline of the United States is second only in length to that of Canada, and the United States and Canada are the only two nations bordered by three oceans.

Total coastline of the United States is 12,255 miles.

Fifteen States share the 1,889-mile Atlantic coastline; five the 1,659-mile coastline of the Gulf of Mexico; and the three contiguous Pacific Coast States a coastline of 1,292 miles.

Alaska, separated from her sister States by both international waters and another nation, has a coastline of 6,640 miles, of which approximately a thousand miles is washed by waters of the Arctic Ocean and the remainder by the Pacific Ocean and the Bering Sea.

Two thousand miles of open sea separate the State of Hawaii from the mainland, and Hawaii has a 775 miles coastline.

Strong support for S. 944 has been expressed by both the Chamber of Commerce of Honolulu, Hawaii, and by the president of the University of Hawaii in communications transmitted to the committee by Hawaii's senior Senator, the Honorable Hiram L. Fong.

Similar support for S. 944 came from scientists of the Great Lakes area.

The Great Lakes, largest connected inland body of fresh water in the world, have a combined shoreline of 4,649 miles. On these shores are some of the world's major industrial centers, their commerce borne on ocean carriers through the lakes, the St. Lawrence Seaway and the St. Lawrence River to markets overseas and to domestic ports along the Atlantic, the gulf, and the Pacific. Connecting rivers and canals, mainly shared with our friendly neighbor to the north, have a combined length of 2,341 miles. The Great Lakes are, in fact, a fresh-water inland ocean, unduplicated on any other continent.

The factors stated above entered strongly into the considerations of the Committee on Commerce of S. 944, and in the inclusion of perfecting and broadening amendments to the bill.

#### A NEW CONTINENT—THE CONTINENTAL SHELF

S. 944 takes cognizance that, as Adm. Edward C. Stephan, former oceanographer of the Navy, put it in his testimony before the committee, "a new continent has been opened up" requiring the attention of marine scientists and engineers with encouragement from the Federal Government.

The new continent is the Continental Shelf, and the ocean floor.

The land area of the United States is 3,615,211 square miles. The surface area of the Continental Shelf adjacent to the United States, as estimated by the Coast and Geodetic Survey, is 850,000 miles, slightly less than one-fourth that of the total land area.

Area of the east coast Continental Shelf was estimated as 140,000 square miles, that of the gulf coast as 135,000 square miles, that of the Pacific coast excluding Alaska as 25,000 square miles, and that of Alaska as 550,000 square miles. The areas of the Continental Shelf off some States along the Atlantic seaboard north of Chesapeake Bay is larger than the land area of the States themselves.

Witnesses at hearings on S. 944 strongly emphasized that since June 1964, a new dimension has been added to the rights and potential rights of nations to exploit the resources of the Continental Shelf.

These rights and potential rights are embodied in the International Convention on the Continental Shelf, which was agreed to by delegates to the Law of the Sea Conference in Geneva, Switzerland, in 1958, and ratified a year ago by the required number of nations, thus giving it the effect of an international treaty.

The Continental Shelf is defined in the Convention as:

1. The seabed and subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters (655 feet) or, beyond that limit, to where the depths of the superjacent waters admit of the exploitation of the natural resources of the said area.

2. The seabed and subsoil of similar submarine areas adjacent to the coasts of islands.

This definition is reflected in section 8(a) of S. 944.

Natural resources of the Continental Shelf, as the shelf is defined by the Convention, may, under the Convention, be exploited exclusively by the adjacent coastal State.

Rights to exploit natural resources of the seabed and subsoil of areas beyond the Continental Shelf may be attained by the nation with the technological or engineering capability to first exploit them.

Thus the Convention conveys both specific and immediate rights and prospective or potential rights, the latter to be acquired only as a result of national effort and achievement.

S. 944 envisions a national program of marine resources and engineering development that will assure to us all rights under the Convention on the Continental Shelf.

Natural resources, as defined in the Convention, consist of "the mineral and other nonliving resources of the seabed and subsoil together with living organisms belonging to sedentary species, that is to say, organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil."

Clams, oysters, the king crab of the Bering Sea and Gulf of Alaska, Dungeness and tanner crabs of the Pacific coast and stone crabs of the Gulf of Mexico would clearly qualify as resources of the Continental Shelf under the above definition, and possibly also the large-clawed lobster of New England and the clawless spiny lobster of southern waters.

The Convention does apply, without qualification, to all mineral and nonliving resources of the Continental Shelf and areas adjacent and beyond "where these areas admit of the exploitation of the said area."

This means, in effect, that the rights to exploit resources beyond the shelf will go to those nations which first develop and use the instruments, equipment, and technologies necessary to exploit them.

President Johnson, in his March 2 communication to the Congress calling for a "unified thrust seaward" stated;

Our view of the seas has had to undergo a drastic change. We have always considered them as barriers to invasion; we now must see them as links, not only between peoples, but to vast untapped resources.

## RESOURCES OF THE MARINE ENVIRONMENT

Scientists generally group the resources of the seas in four great categories: physical, geological, chemical, and biological.

First and oldest resource utilized by man come under the last heading—fish and shellfish. Several of the world's greatest fisheries are immediately off our coasts. They are so productive that 12 overseas foreign nations compete each year for this treasure.

Expert testimony was presented to the committee during hearings on S. 944 that with modernized vessels, equipment and gear, the harvest from these fisheries could be increased tenfold.

The seabed and subsoil hold mineral resources of incalculable extent and value. These are covered by the Convention on the Continental Shelf.

The resource in this category presently most exploited is petroleum or oil. Since 1960 approximately \$800 million has been paid into the Federal Treasury by industry from the lease of offshore oil rights. Impressive sums also have been paid into the treasuries of some of our coastal States.

Petroleum engineers and geologists believe we have only commenced to tap the vast submarine oil reserves that lie along portions of our coasts, and then only where the seas above the Continental Shelf are shallow. More and more oil, they assure, will be produced from beneath the seas with broadened exploration and with the development of equipment and technology to economically extract this liquid treasure from ever-increasing depths.

And the Continental Shelf holds many other mineral resources of value. Submarine mining operations beneath shallow seas are being carried on in various parts of the world for tin, sulfur, iron, and coal. Offshore dredging operations for diamonds are proving profitable along parts of the southwest African coast. Gold is being taken from Alaskan sands and the Alaska Division of Mines and Minerals has granted permits for 39 offshore mining leases while applications for other leases await action.

Phosphorite, not imported from overseas for use in certain fertilizers, is found in huge nodules occurring at depths of 100 to 600 feet off the California coast, and some deposits are estimated to weigh as much as 30 pounds per square foot.

Research is being conducted by the Bureau of Mines into the potential economic value of glauconite deposits in waters from 60 to 2,400 feet deep along the coasts of Oregon and Washington, and also occurring in waters and open pits in mid-Atlantic States. Used in its raw form as a soil conditioner and water softener, glauconite is a definite source of potash, with iron a possible byproduct.

Similar studies are being made of the commercial potential of heavy-mineral sands, also known as "black sands" lying beneath near-shore waters along some parts of the coast, but principally in the Southeast and the Pacific Northwest.

Heavy mineral sands contain varying values in gold, platinum, iron, titanium, chromium, zirconium, columbium, tantalum, tin, tungsten, and other elements.

Funding for exploration, research and development of this resource has been very limited, but with the anticipated technological advances of the next few years, these sands are expected to have substantial economic value to the Nation.

## MINERALS OF THE DEEP-OCEAN FLOOR

Major interest of oceanographic institutions and also of several Government departments in mineral resources of the marine environment centers, however, on vast accretions of manganese nodules, varying in size from marbles to potatoes, which in many areas carpet the ocean floor.

These nodules, containing manganese, iron, cobalt, nickel, and copper, and in smaller percentages molybdenum, vanadium, zirconium, lead, and zinc, occur at depths of 3,000 to 17,000 feet, with the richer concentrations lying at the greater depths.

Deep-ocean photographs of concentrations have been taken by United States, Russian, and other oceanographic research vessels, and some have been brought up in clamshell-bucket type dredges or deep-ocean "grabs."

Photographs indicate that from 5 to 10 pounds of nodules per square foot lie in many ocean areas of the Atlantic and Pacific.

The fact that these concentrations of important minerals exist and that they exist on floor areas of the deep ocean presents a challenge to marine technologists and engineers. The challenge is to develop devices and equipment that will enable the economic recovery of these minerals from the ocean bed, and that will do so before some other nation can claim "squatters rights" under the Convention on the Continental Shelf.

Studies of proposed equipment and techniques for bringing nodules from depths of 8,000 to 14,000 feet are underway, and one symposium attended by many scientists and engineers, has been held on the subject.

When the technology is developed for recovering these nodules and for separating their basic elements, the world will have an inexhaustible source of the metals they contain. In addition to the 15 trillion tons resting on the Pacific floor alone, it is estimated that they are forming at a rate of 10 million tons a year, or in other words, accumulating, in the case of manganese, cobalt, and nickel, at a rate many times that of present world consumption.

Resources of the marine environment include sea water itself. Magnesium, bromine, and salt already are produced commercially from sea water in substantial quantities. As greater and greater quantities of fresh water are extracted from sea water at lower and lower costs—an advance that ocean engineers envision as inevitable—other elements will be extracted from the residue including, it is predicted, sulfur and possibly aluminum.

Science, exploration and engineering is opening up a vast new frontier.

The United States has been in large measure the pioneer, but today many nations are challenging us, even to our very doorsteps, for the rich resources that abound in this frontier.

S. 944 is designed to help the United States meet that challenge and maintain leadership in the oceans.

## NUCLEAR POWER FOR OCEAN RESEARCH, MINING, AND EXPLOITATION

Ultimately, and possibly in the not distant future, some of the industrial processes involved in the exploitation of deep ocean resources will be processed by energy produced not on shore, but at the bottom of the ocean.

The Atomic Energy Commission, as early as 1960, developed radioisotope nuclear power packages for use as a supplementary source of electricity to power radio transmitters aboard orbiting space satellites, and this year a nuclear reactor power system operated in space as the sole source of a satellite's power.

Recognizing that an ocean engineer would ask for similar characteristics in an undersea powerplant, AEC is now engaged in the development of systems for nuclear auxiliary power, commonly referred to as SNAP, for marine applications.

"Two major programs, SNAP 21 and 23, are now underway," Dr. Nelson F. Sievering, Jr., of AEC, recently reported.

They offer promise of providing reliable thermoelectric isotopic power generators that will be light in weight, possess maintenance-free operating lifetimes in excess of 5 years, and relatively inexpensive to fabricate \* \* \*. They could power current meters, seismographic instruments, wave recorders, and other similar instruments. Other possible uses include power for navigational beacons, anti-submarine warfare systems, ocean mining and exploration, unmanned weather and oceanographic buoys, and underwater communications.

Dr. Sievering stated that the SNAP program has considered the development not only of radioisotope power systems, but also of "compact nuclear reactor systems for the supply of large blocks of power for space applications."

"The design requirements for underwater nuclear power systems presently appear," Dr. Sievering added, "far less stringent than requirements for operation in space. Such problems as launch vibrations, operation in a high vacuum, and zero gravity are not considerations. Consequently the more rigorous features developed for use in space can probably be relaxed and simplified when meeting the design objectives of an underwater system."

Stating that AEC has for a number of years conducted a program for the development of nuclear powerplants to support military operations, Dr. Sievering concluded:

A strong technology base is present in this area, in both water and gas cooled reactors, and it could possible be utilized to provide the large undersea reactor powerplants that can be foreseen for such applications as: undersea construction, large undersea laboratories, offshore oil drilling and production equipment, and undersea mining and dredging operations.

The Chairman of the Atomic Energy Commission would be a member of the National Council on Marine Resources and Engineering Development established upon the enactment of S. 944.

As a result of the testimony received during 3 days of public hearings, plus extensive consultations with many persons, inside and outside the Government, who have extensive experience in oceanography, marine engineering and allied fields, the committee has approved an amendment in the nature of a substitute for the text of S. 944.

The committee amendment broadens the scope of the bill, changes its emphasis, and clarifies its provisions, as explained hereafter.

I. *Oceanography and marine engineering.*—Despite its long and continuing interest in oceanography, the committee believes the term is too narrow in scope and application to meet the current needs of the Nation. Oceanography is defined as “a science that deals with the ocean and its phenomena.” Scientific consideration of our marine environment is an important matter of public concern and governmental interest, but our national policy and effort must equally concern itself with the exploration, development, and use of all the resources of the oceans. These are matters which go beyond the interest of oceanography. For lack of a more precise word, the committee has drafted the bill in terms of marine science activities, which has been defined to include oceanography, engineering, technology, and all related activities.

In this way the committee has sought to express its conviction that our policies and programs must have an applied engineering objective, as well as a scientific goal, and that programs aimed at the beneficial use of marine resources of all types should, where necessary and desirable, take priority over programs having a less direct application.

II. *Private enterprise investment.*—The committee amendment is also designed to place greater stress on the importance of private investment in marine science activities. Language expressing this objective has been inserted in section 2 of the bill, the declaration of policy and purpose. In addition, the Commission on Marine Science, Engineering, and Resources, created under section 4 of the bill, is specifically charged with the responsibility of making recommendations for the encouragement of private investment in marine science and resource development. While there are important areas involving marine science activity which properly fall within the scope of the Federal Government, the real potential for use and development of marine resources must be brought to fruition by American private enterprise.

In this connection, the bill also directs the Commission and the Council to study the legal problems involved in ocean development, because the committee believes a proper legal framework must be established before private enterprise can be expected to risk the capital funds required for marine resource development.

III. *Organization of the marine science activities of the Federal Government.*—The committee has not recommended the creation of a new, overall Federal agency to carry out Federal programs involving marine science activities. The committee does not believe that the current programs in oceanography and marine science activity now conducted by departments and agencies like the Navy, the Bureau of Commercial Fisheries, the Coast Guard, the Coast and Geodetic Survey, or financed by the National Science Foundation can effectively be merged into a new agency without serious disruption to the broader missions of these departments and agencies. Instead, it has sought to

provide more effective coordination and cooperation through the establishment of the National Council on Marine Resources and Engineering Development, a Cabinet-level group, to be chaired by the Vice President of the United States. The Council would be specifically charged with aiding the President in making sure that the marine science activities of all Federal agencies dovetail effectively, without wasteful duplication or costly gaps. The Council, and the Commission would both be charged with a duty to survey the organizational structure of the Federal Government in this respect and the making of such recommendations for changes as may be necessary to meet the needs of the Nation in this area.

Because the technology in oceanography and marine engineering is expanding at an explosive rate, the committee did not want to freeze the pattern of Federal activities into a fixed mold which might not have the flexibility to respond to the demands of the new technology. It regards the Council as retaining this flexibility, and the advice of the Commission will bring to bear on the whole problem a wide range of informed and expert opinion. The committee has also inserted a termination date in the bill in line with this approach, and to assure a full scale congressional review after 5 years.

#### AGENCY COMMENTS

Reports of agencies follow:

COMPTROLLER GENERAL OF THE UNITED STATES,  
*Washington, March 3, 1965.*

HON. WARREN G. MAGNUSON,  
*Chairman, Committee on Commerce,  
U.S. Senate.*

DEAR MR. CHAIRMAN: Your letter of February 11, 1965, requests our comments on S. 944. The purpose of the bill is to provide for expanded research in the oceans and the Great Lakes and to establish a National Oceanographic Council.

We have no special information to offer the committee which would assist in consideration of the bill and, since it involves a matter of policy for determination by the Congress, we make no recommendation concerning its enactment.

Sincerely yours,

JOSEPH CAMPBELL,  
*Comptroller General of the United States.*

GENERAL COUNSEL OF THE  
DEPARTMENT OF COMMERCE,  
*Washington, D.C., April 15, 1965.*

HON. WARREN G. MAGNUSON,  
*Chairman, Committee on Commerce,  
U.S. Senate, Washington, D.C.*

DEAR MR. CHAIRMAN: This letter is in reply to your request for the views of this Department with respect to S. 944, a bill to provide for expanded research in the oceans and the Great Lakes, to establish a National Oceanographic Council, and for other purposes.

S. 944 would set forth national objectives for oceanographic and marine activities and would establish a National Oceanographic Council composed principally of Cabinet-level officers. The Council

would advise and assist the President by surveying present oceanographic activities, developing an oceanographic program, coordinating the agencies' oceanographic activities and annually comparing Federal oceanographic accomplishments against the Council's oceanographic program. The Council would be authorized to employ an executive secretary and staff. S. 944 would also require the President to report annually to Congress on his oceanographic program and on present accomplishments.

The Department strongly supports improvement in and greater emphasis for the national oceanographic program. However, we doubt that S. 944 would have enough beneficial effect upon oceanographic activities to offset the detrimental effect it would have upon the administration of oceanography as a whole.

The Interagency Committee on Oceanography has had considerable success in coordinating and stimulating Federal oceanographic activities, and we are therefore not aware of overriding reasons for replacing it. The proposed National Oceanographic Council would not change the realities involved in setting priorities and apportioning limited funds among less limited demands within the agencies. There is no reason to believe that Council review of the national oceanographic program before its submission to the agencies would keep any agency from balancing its oceanographic program needs against the needs of its other programs. On the other hand, creation of the proposed Council would place additional demands directly upon Cabinet officers and agency heads who already have heavy burdens of responsibility.

If the Council supplants the Interagency Committee on Oceanography, the limited amount of personal time which the Council members could devote to Council activities might result in less consideration of oceanography within the executive branch than presently exists. If the Council and the Interagency Committee on Oceanography both exist there will be substantial duplication of efforts and possible conflict of proposed programs. We think it is better to leave oceanographic planning and coordination in the hands of the policy and operating officials who work with the oceanographic program, serve on the Interagency Committee on Oceanography and who are thus most qualified to advise the President on its needs.

For these reasons, the Department strongly favors the objectives of the bill but is opposed to the establishment of a Council to accomplish these objectives. If the bill were amended to permit the President to establish such mechanisms as he believes necessary to accomplish these objectives, we would favor the bill.

We have been advised by the Bureau of the Budget that there would be no objection to the submission of our report from the standpoint of the administration's program.

Sincerely,

ROBERT E. GILES.

#### CHANGES IN EXISTING LAW

There are no changes in existing law.